CLAIMS:

1. A method of controlling atmospheric conditions in a portion of the atmosphere containing microscopic water droplets dispersed therein so as to produce their desired coalescence and precipitation, the method includes:

(a) determining a size distribution of water droplets in said portion of the atmosphere;

(b) providing a predetermined amount of a seeding material having uncharged seeding elements of a predetermined size distribution;

(c) electrically charging the uncharged seeding elements so as to produce charged seeding elements having a predetermined polarity and charge magnitude, said predetermined polarity and charge magnitude being calculated by using a collision model describing collisions between said charged seeding elements and said microscopic water droplets; and

(d) seeding said charged seeding elements in said portion of the atmosphere.

2. The method of claim 1 wherein said portion of the atmosphere is a portion of cloud.

3. The method of claim 1 wherein said portion of the atmosphere is a portion of fog.

4. The method of claim 1 wherein the water droplets are substantially electrically neutral.

5. The method of claim 1 wherein the water droplets are electrically charged.

6. The method of claim 1 wherein the calculation of the polarity and charge magnitude of the seeding elements takes into account said size distribution of the water droplets in said portion of the atmosphere.

7. The method of claim 3 wherein said seeding elements are charged with opposite polarity charges.

8. The method of claim 2 wherein said seeding elements are charged with the same polarity charges.

9. The method of claim 1 wherein said seeding material includes particles of a particulate material.

10. The method of claim 1 wherein said seeding material includes atmospheric water droplets.

11. The method of claim 9 wherein the providing of the particulate material includes burning a pyrotechnic material.

12. The method of claim 9 wherein the particles are soot particles.

13. The method of claim 9 wherein the particulate material is a powdered solid material.

14. The method of claim 1 wherein a size of said seeding elements ranges from 0.1 micron to 20 microns.

15. The method of claim 1 wherein the charge magnitude of the charged seeding elements ranges from about $\pm 10^{-16}$ Coulomb to about $\pm 10^{-12}$ Coulomb.

16. The method of claim 1 wherein said electrically charging of the seeding elements comprising passing the particles through an electric discharge of a predetermined discharge characteristic.

17. The method of claim 16 wherein said electric discharge is corona discharge.

18. The method of claim 1 wherein said electrically charging of the seeding elements comprising bringing said seeding elements into contact with charged electrodes.

19. The method of claim 18 wherein said charged electrodes are grid electrodes.

20. The method of claim 1 wherein the controlling of the atmospheric conditions is effected from a flying object.

21. The method of claim 1 wherein the controlling of the atmospheric conditions is effected from a ground located source.

22. The method of claim 21 wherein the ground located source is a chimney stack.

23. A method of controlling atmospheric conditions in a portion of the atmosphere containing microscopic water droplets so as to cause their coalescence and precipitation, the method characterized by:

adjusting non-gravitational attraction forces between the droplets to a predetermined value so as to alter an effective collision rate between the water droplets, where said adjusting of the non-gravitational attraction forces includes:

(a) determining a size distribution of water droplets in said portion of the atmosphere;

(b) providing a predetermined amount of a seeding material having uncharged seeding elements of a predetermined size distribution;

(c) electrically charging the uncharged seeding elements so as to produce charged seeding elements having a predetermined polarity and charge magnitude, said predetermined polarity and charge magnitude being calculated by using a collision model describing collisions between said charged seeding elements and said microscopic water droplets; and

(d) seeding said charged seeding elements in said portion of the atmosphere.

24. The method of claim 23 wherein said portion of the atmosphere is a portion of cloud.

25. The method of claim 23 wherein said portion of the atmosphere is a portion of fog.

26. The method of claim 23 wherein said droplets are substantially electrically neutral.

27. The method of claim 23 wherein said droplets are electrically charged.

28. A method of claim 23 wherein the calculation of the polarity and charge magnitude of the seeding elements takes into account said size distribution of the water droplets in said portion of the atmosphere.

29. The method of claim 25 wherein said seeding elements are charged with opposite polarity charges.

30. The method of claim 24 wherein said seeding elements are charged with the same polarity charges.

31. The method of claim 23 wherein said seeding material includes particles of a particulate material.

32. The method of claim 23 wherein said seeding material includes atmospheric water droplets.

33. The method of claim 31 wherein the providing of the particulate material includes burning a pyrotechnic material.

34. The method of claim 31 wherein the particles are soot particles.

35. The method of claim 31 wherein said particulate material is a powdered solid material.

36. The method of claim 23 wherein the seeding elements have a spread of sizes ranging from sub-micron to several micron sizes.

37. The method of claim 23 wherein the charge magnitude of the charged seeding elements ranges from about $\pm 10^{-16}$ Coulomb to about $\pm 10^{-12}$ Coulomb.

38. The method of claim 23 wherein said electrically charging of the seeding elements comprising passing the particles through an electric discharge of a predetermined discharge characteristic.

39. The method of claim 38 wherein said electric discharge is corona discharge.

40. The method of claim 23 wherein said electrically charging of the seeding elements comprising bringing said seeding elements into contact with charged electrodes.

41. The method of claim 23 said effective collision rate is proportional at least to a collision efficiency and a concentration of the droplets.

42. The method of claim 41 wherein said collision efficiency has a value higher than 1.

43. The method of claim 41 wherein said collision efficiency ranges from 0.001 to 1000.

44. The method of claim 23 wherein the controlling of the atmospheric conditions is effected from a flying object.

45. The method of claim 23 wherein the controlling of the atmospheric conditions is effected from a ground located source.

46. The method of claim 45 wherein said ground located source is a chimney stack.

47. An apparatus for controlling atmospheric conditions in a portion of the atmosphere containing microscopic water droplets dispersed therein, the apparatus comprising:

(a) at least one apparatus portion for controllable producing unipolar charged seeding elements, each apparatus portion comprising:

(i) a chamber for providing an element flow stream of a seeding material containing uncharged seeding elements having a predetermined size;

(ii) a charger downstream of the chamber and in communication therewith for charging said uncharged seeding elements in said element flow stream so as to produce charged seeding elements having a predetermined polarity and charge magnitude;

(iii) a seeder for controllable scattering said charged seeding elements in said portion of the atmosphere,

(b) an electrical power source for providing electrical power required for operation of the apparatus, and

(c) a control module for controlling operation of the apparatus on the basis of a collision model describing collisions between said charged seeding elements and said microscopic water droplets.

48. The apparatus of claim 47 comprising two apparatus portion for controllable producing positively and negatively charged seeding elements, respectively.

49. The apparatus of claim 47 wherein said seeding material includes particles of a particulate material.

50. The apparatus of claim 49 wherein the chamber comprises a feeder for providing a predetermined amount of the particulate material derived from a required kind of a raw material.

51. The apparatus of claim 50 wherein said chamber includes a fan for providing an air flow stream for mixing with said particulate material, thereby producing an element flow stream.

52. The apparatus of claim 50 further comprising a burner coupled to the chamber for burning said raw material so as to form the particulate material as a combustion product.

53. The apparatus of claim 52 wherein said combustion product is soot particles.

54. The apparatus of claim 47 wherein said seeding material includes atmospheric water droplets.

55. The apparatus of claim 54 wherein said chamber includes an inlet for receiving an input air flow stream from atmosphere and transferring the input air flow stream comprising the atmospheric water droplets to the chamber, thereby providing an element flow stream.

56. The apparatus of claim 55 further including a suction device arranged in said inlet.

57. The apparatus of claim 48 wherein the chamber of each apparatus portion includes a feeder containing water and a manifold configured for providing the water to a spray nozzle for creating water droplets.

58. The apparatus of claim 57 wherein said manifold includes an electrode coupled to the power source for charging the water passing therethrough with the desired electric potential, thereby creating charged water droplets.

59. The apparatus of claim 48 wherein the chamber of each apparatus portion further comprises a feeder containing water as a raw material.

60. The apparatus of claim 59 wherein said feeder includes droplet maker configured for making water droplets of desired size.

61. The apparatus of claim 60 wherein the droplet maker is an ultrasonic mist generator.

62. The apparatus of claim 59 wherein the chamber further comprises a water collection section for collecting and precipitating atmospheric droplets from said input air flow stream, where said collection section includes a rotor arranged for displacing the atmospheric water droplets to the walls of the collecting section.

63. The apparatus of claim 59 wherein said water is coupled to said electrical power source via an electrode for providing an electric potential thereto.

64. The apparatus of claim 47 wherein said portion of the atmosphere is a portion of cloud.

65. The apparatus of claim 47 wherein said portion of the atmosphere is a portion of fog.

66. The apparatus of claim 47 wherein said droplets are substantially electrically neutral.

67. The apparatus of claim 49 wherein the particulate material is a powder.

68. The apparatus of claim 47 wherein the seeding elements have a spread of sizes ranging from sub-micron to several micron sizes.

69. The apparatus of claim 47 wherein the value of the charge of the seeding elements ranging from about $\pm 10^{-16}$ Coulomb to about $\pm 10^{-12}$ Coulomb.

70. The apparatus of claim 47 wherein the charger comprises at least one electrode for producing an electric field.

71. The apparatus of claim 70 wherein said at least one electrode is configured in a form of at least one grid.

72. The apparatus of claim 71 wherein the grid is selected from two-dimensional and three-dimensional grids.

73. The apparatus of claim 47 wherein the charger comprises at least one electrode for producing an electric discharge.

74. The apparatus of claim 55 wherein said control module includes a first strain regulator arranged in the inlet for producing a first sensor signal representative of a strain of the air in the air flow stream, the control module being responsive to said first sensor signal for controlling the strain.

75. The apparatus of claim 47 wherein said control module includes a second strain regulator arranged in the outlet for producing a second sensor signal representative of a strain of the element flow stream, the control module being responsive to said second sensor signal for controlling the strain.

76. The apparatus of claim 47 wherein said control module includes a third strain regulator arranged in the seeder for producing a third sensor signal representative of a strain of the charged element flow stream, the control module being responsive to said third sensor signal for controlling the strain.

77. The apparatus of claim 52 wherein said control module includes a temperature regulator arranged in the chamber and is responsive to a signal produced thereby for controlling temperature in the burner.

78. The apparatus of claim 47 wherein said control module includes a charge regulator arranged in the charger and is responsive to a signal produced thereby for controlling the charge magnitude and/or polarity of the charged particles.

79. The apparatus of claim 60 wherein said control module is coupled to said droplet maker responsive to a droplet size signal produced by the control module for controlling the size of said water droplets.

80. The apparatus of claim 47 for use with a flying object.

81. The apparatus of claim 47 for use with a ground located source.

82. The apparatus of claim 81 wherein said ground located source is a chimney-stalk.

83. Rain obtainable by the method of claim 1.

84. Rain obtainable by the method of claim 23.